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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/539,500

06/17/2005

Niels Christian Weihrauch

6495-0110WOUS

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7590

08/25/2006

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EXAMINER

MULLINS, BURTON S

ART UNIT

PAPER NUMBER

2834

DATE MAILED: 08/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/539,500	<b>Applicant(s)</b> WEIHRAUCH, NIELS CHRISTIAN	
	<b>Examiner</b> Burton S. Mullins	<b>Art Unit</b> 2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 17 June 2005.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1,3-5 and 12-17 is/are rejected.  
7) ☒ Claim(s) 2 and 6-11 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Information Disclosure Statement***

2. The information disclosure statement (IDS) submitted on 17 June 2005 has been considered by the examiner.

### ***Response to Amendment***

3. Applicant's preliminary amendment filed 17 June 2005 has been entered.

### ***Claim Objections***

4. Claim 16 is objected to because of the following informalities: the phrase "wherein in at least one sector...the conductor rods" is repeated. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

5. Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Recitations "...and disregarding the curvature of the accommodating spaces" and "the longitudinal axes of the accommodating spaces...are arranged to be turned in relation to the magnet axis in such a manner that...the radial outer ends of the accommodating spaces...are

located at a smaller distance to the magnet axis than with a radial alignment” are indefinite and make no sense.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 3-5 and 12-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki et al. (WO 01/06624) in view of Nakada et al. (JP 56-071442). Sasaki teaches a synchronous motor comprising a rotor with 21 axially extending receiving spaces 25 for permanent magnets 26 and with axially extending accommodating spaces (slots) 23 for conductor rods 24 (Fig.1, p.23, lines 5-16), wherein in at least one sector of the rotor the accommodating spaces 23 for the conductor rods 24 have a substantially elongate cross-section (Figs.1&2).

Sasaki does not teach that in the spaces' elongate cross-section sector, in a cross-sectional view, the accommodating spaces for the conductor rods are made to be curved along their longitudinal axis.

Nakada teaches a motor rotor 1 including accommodating spaces (rotor slots) 2A for the conductor rods and made to be curved along their longitudinal axis (Fig.6). This reduces the torque variation of the motor.

It would have been obvious to modify Sasaki and provide, in the elongate cross-section sector, in a cross-sectional view, accommodating spaces for the conductor rods which are curved along their longitudinal axis per Nakada since this would have reduced torque variation of the motor.

Regarding claim 3, in Nakada the distance between the accommodating spaces for the conductor rods 2A is constant (Fig.6).

Regarding claim 4, Nakada teaches the curved slots while Sasaki Fig.5 teaches accommodating spaces 33-39 for the conductor rods arranged along their longitudinal axis in such a manner that the distance of the accommodating spaces for the conductor rods to the rotational axis of the rotor, in a cross-sectional view through the rotor, increases from the neutral axis (near slot 33) in the direction of the magnet axis (near slot 39).

Regarding claim 5, as best understood, Nakada's curved slots, when combined with Sasaki, would teach "the longitudinal axes of the accommodating spaces...are arranged to be turned in relation to the magnet axis in such a manner that...the radial outer ends of the accommodating spaces...are located at a smaller distance to the magnet axis than with a radial alignment" [sic] since Nakada's curved slots would be turned in relation to Sasaki's magnetic axis and their ends close to the magnet axis.

Regarding claim 12, Sasaki's rotor has at least one transition zone or barrier 27 in which the accommodating spaces for the conductor rods are not curved since they prevent shortcircuiting of the flux developed between neighboring opposed poles (p.32, lines 12-15).

Regarding claim 13, in both Sasaki and Nakada, the accommodating spaces for the conductor rods are closed on the radial outside.

Regarding claims 14 and 16, see Sasaki Fig.24 which shows a stator comprising a plurality of windings, and rotor is arranged to be rotational inside the stator.

Regarding claims 15 and 17, in Sasaki short-circuit rings 44a (Fig.14) are arranged on the front sides of the rotor, said short-circuit rings connecting the conductor rods 43 with each other.

***Allowable Subject Matter***

8. Claims 2 and 6-11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 2, the prior art does not teach or suggest several permanent magnets, particularly four permanent magnets, located so that they generate a rotating magnet field with a neutral axis and a magnet axis, which is arranged to be perpendicular to the neutral axis, the curvature radii of the accommodating spaces for the conductor rods decreasing from the neutral axis in the direction of the magnet axis.

Regarding claim 2, the prior art does not teach or suggest that in a cross-sectional view through the rotor, in the vicinity of the neutral axis and disregarding the curvature of the accommodating spaces, the longitudinal axes of the accommodating spaces for the conductor rods are aligned substantially radially in relation to the rotor, and in that in a cross-sectional view through the rotor the longitudinal axes of the accommodating spaces for the conductor rods are arranged to be turned in relation to the magnet axis in such a manner that in a cross-sectional view through the rotor the radial outer ends of the accommodating spaces for the conductor rods are located at a smaller distance to the magnet axis than with a radial alignment.

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Regarding claim 6, the prior art does not teach or suggest that in a cross-sectional view each accommodating space for the conductor rods has two side walls, which have different curvatures.

Regarding claim 10, the prior art does not teach or suggest that the receiving spaces for the permanent magnets are curved and arranged around the rotational axis of the rotor in such a manner that in a cross-sectional view through the rotor the distance between the receiving spaces for the permanent magnets and the accommodating spaces for the conductor rods is larger in the area of the magnet axis than in the area of the neutral axis.

### ***Conclusion***

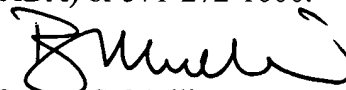
9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Burton S. Mullins whose telephone number is 571-272-2029.

The examiner can normally be reached on Monday-Friday, 9 am to 5 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on 571-272-2044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Burton S. Mullins  
Primary Examiner  
Art Unit 2834

bsm

21 August 2006